Closing in on Closure

Fluor Hanford accelerates removing debris from K East

The ability of the K Basins Closure (KBC) Project to remove solid nuclear waste (debris) from the K East Basin has been dramatically improved by a new, engineered Debris Loadout Station installed in the K East Basin in late summer, along with an increased focus on debris removal. Last month, Fluor Hanford workers began removing the first of 204 large fuel racks from the basin. Within one week, they sped up their removal rate beyond the best planning case. They are also bringing out thousands of pounds of additional debris that has accumulated in the basin in the 30 years since it was reactivated to store N Reactor fuel in 1975.

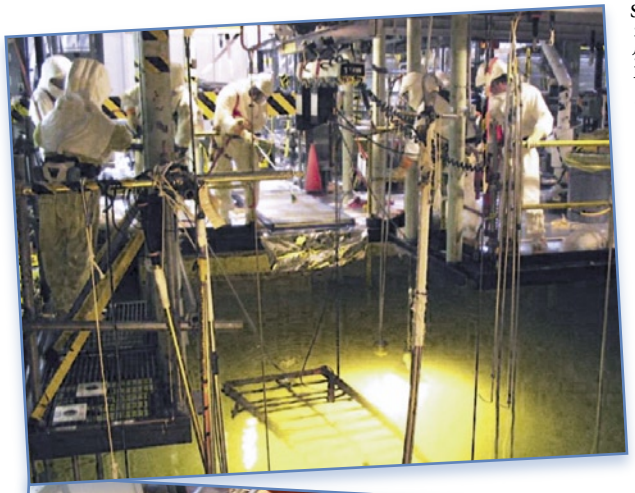
Removing the highly contaminated fuel racks is not an easy task. It takes a crew of 15 people, including riggers, millwrights, nuclear chemical operators, and radiological control technicians, to maneuver each rack up and out in a safe manner. Two-thirds of the racks are 10 feet long and weigh 300 pounds apiece, while the rest are nearly 15 feet long and weigh 500 pounds each. As a way to reduce worker dose, the racks are not being cut up.

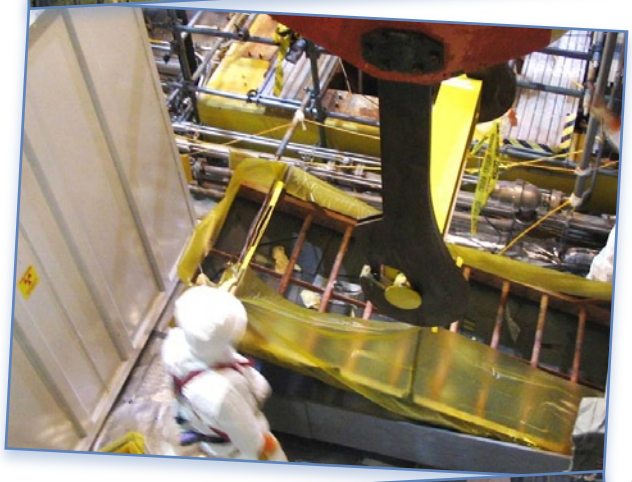
Crews first grapple and pressure-wash a rack underwater. Riggers then attach special equipment and maneuver it through the Loadout Station and set it on a new roller table above the water in the southwest corner of the basin. The roller table and an east-west monorail are the key components in the new K East Debris Loadout Station, located over an area of the basin that is known as "Crater Lake."

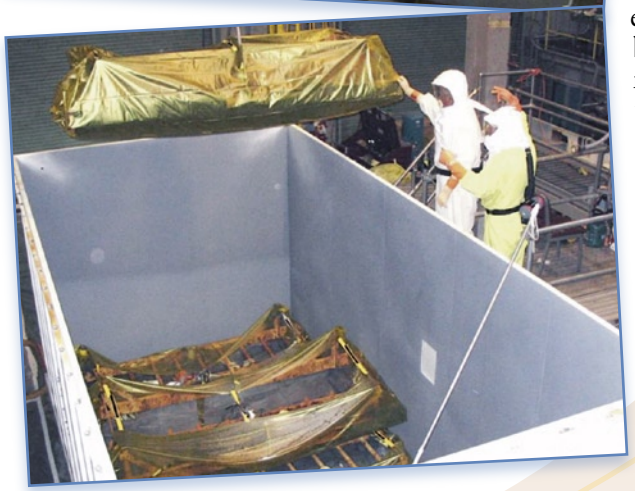
After the rack is placed in a protective poly wrap called a "diaper," to contain contamination, it is moved down the roll-table to the transfer bay, sprayed with a contamination fixative, and loaded into a large industrial container (known as an IP-2) to be staged for future burial as low-level waste. About 20 of the 10-foot long racks can fit into an IP-2, or 10 of the 15-foot long racks.

Workers performing rack removal work must wear two pairs of waterproof protective clothing, and use respirators, due to contamination levels on the debris and in the basin's sludge and water. Electric hoists and underwater lights are necessary to guide the work. Despite the rigor and awkwardness of the job, crews were able to remove six racks in one nine-hour shift in September – three more racks than the shift goal set for the start-up period of this critical activity.

KBC







A new loadout station improves the ability to remove debris from the K East Basin. A rack is removed (top). The transfer bay crane lifts a rack out of the liner (center). A rack is placed into an IP-2 shipping container (bottom).

"The crews are working like NASCAR pit crews now," said field work supervisor Dave Hegg. "They're fast, efficient, streamlined, and they really want to get the work done. They're looking after each other in terms of safety, and they work together." There have been no skin contaminations and no loss of contamination control in the work area, despite the untried and difficult nature of the rack work."

Rob Gentry, K East Basin sludge and debris manager, transferred in early September to the K East Basin from the West Basin, where he had managed the removal of thousands of canisters, lids, tools, and other equipment. "The work in K East is a lot more challenging for many reasons," he said. "The water clarity issue is huge – as soon as we touch anything in the East Basin, the flighty sludge swirls up and makes everything cloudy or opaque, so we have to work with cameras." However, he said, "the workers are great in both facilities. I'm impressed with how much ownership they have. They really want to accomplish work."

A pause in the pumping of K East Basin sludge in late summer allowed sludge to settle, revealing a comprehensive view of the remaining debris, said Rhonda Nissen, debris removal shift manager at KE. "Before that, we had been able to see just a small portion of the basin at a time, and that was through cameras mounted on 22-foot long poles."

After vacuuming and containing approximately 80 percent of the estimated sludge in the K East Basin, crews uncovered several times the volume of debris originally estimated. KBC management and work crews quickly decided this debris, which exists in many shapes and sizes, made it impractical to vacuum the remaining sludge effectively. They turned their attention to removing debris, and will continue to do so until enough debris has been extracted to allow sludge removal work to proceed ef-

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ficiently. "We decided that moving debris around the basin wasn't the answer – removing it was the answer," Gentry said.

"Clearly, vacuuming the final 20 percent of the sludge will be the most challenging," said Pete Knollmeyer, vice president for the KBC Project. "Previously, sludge pumps and hoses sometimes became entangled on K East Basin debris, slowing the work. We simply have to get the debris out of the way before we can tackle that last 20 percent of the sludge in an efficient manner."

The debris removal work is daunting. Gentry's teams have so far identified 12 additional pumps that need to be removed, approximately 2,000 feet of hoses, small debris which they estimate will fill 90 large debris baskets, 10 structural brackets weighing approximately 200 pounds each, 400 additional pole tools, the fuel racks, and a variety of other miscellaneous debris. Debris and racks remaining in the K East Basin have a volume of approximately 16,000 cubic feet and are estimated to weigh about 86 tons.

Under Nissen, crews have removed five pumps, 1,000 feet of hoses, about 500 pole tools, a canister elevator weighing 2,000 pounds, and a large canister wash station. Approximately 4,500 cubic feet of debris and racks already removed from the K East Basin are estimated to weigh more than 21 tons. "Seeing debris actually leave the basin has improved morale quite a bit," Nissen said. "There is a definite sense of accomplishment, and people feel good about what they are seeing."

The KBC crews have already identified several ways to perform more efficiently. They pack debris together to minimize waste volume. In addition, as soon as the K East Basin walls were downgraded from the "Safety Class" to a "Safety Significant" facility last month, workers brought up several suggestions to work more efficiently. The safety categories are based on the hazards present in facilities.

After debris and sludge removal, the walls and floor of the K East Basin will be hydrolased to remove an outer layer of contamination embedded in the concrete. Then the basin will be dewatered, filled with grout, cut up, and removed in giant blocks to Hanford's Environmental Restoration Disposal Facility. The water will be sent to the 200 Area Effluent Treatment Facility for permitted treatment.

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